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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION
U.S. DISTRICT COURT

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CUMMINS-ALLISON CORP.,
an Indiana Corporation,

Plaintiff,

vs.

GLORY LTD., a Japanese Corporation;
GLORY SHOJI CO., LTD., a Japanese
Corporation; and GLORY (U.S.A.) INC., a
California Corporation,

Defendants.

Civil Action No. 02 C 7008

Honorable Judge Ronald Guzman

Honorable Mag. Judge Sidney I. Schenker

DECLARATION OF TOSHIO NUMATA

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I, Toshio Numata, hereby declare that:

1. I am the Product Manager of currency counter and discriminator machines for Glory Ltd. I have worked at Glory Ltd. for twenty-six years. I am familiar with the design and operation of our company's products. From 1977-1999, I worked in the Design Department for Glory's products. During this time, my responsibilities and duties included the design of Glory's currency counter and discriminator machines. For example, I was responsible for designing the electrical circuits and software for Glory's currency counter, discriminator, and sorter machines. From 1993-1995, I was also the manager of the design of the mechanical components, electrical circuitry, and software for Glory's currency counter, discriminator, and sorter machines.

2. I graduated from Meiji University in 1976 with a B.S. in electronics.

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I have personal knowledge of the facts set forth in this Declaration and am competent to testify thereto.

3. Glory's UF-1 currency counter and discriminator machine is a desktop currency counter and discriminator machine.

4. The UF-1 currency counter and discriminator machine contains a single input receptacle and single output receptacle and a single reject receptacle. The currency bills to be processed are transported one by one from the input receptacle to the output receptacle in a direction parallel to the narrow dimension of the bills.

5. The UF-1 currency counter and discriminator machine uses a magnetic pattern recognition technique to automatically determine the denominations of the bills. A magnetic sensor positioned along the transport path to detect a magnetic signal from a bill passing by the sensor.

6. The UF-1 currency counter and discriminator machine denominates bills independently of the size of the bills.

7. The UF-1 currency counter and discriminator machine has several modes of operation. In a "mixed denominations" mode, the UF-1 machine processes a stack of currency bills having mixed denominations, determines the denomination of each bill, counts the number of bills of each denomination and totals the amount of the bills in the input stack. When the machine encounters a bill that it cannot discriminate (a "reject"), the reject bill is diverted to the single reject pocket and the UF-1 machine continues transporting the subsequent bills. The UF-1 currency counter and discriminator machine does not stop when a reject bill is encountered. See Exhibit 1a at page 1 of Mouri declaration.

8. In a "designated denomination" mode, the UF-1 machine processes a stack of currency bills intended to have the same denomination. The machine verifies the denomination of each bill, counts the number of bills and totals the

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amount of the designated denomination in the input stack. When the machine encounters a bill that is other than the designated denomination, or a bill that cannot be discriminated (a "reject"), the reject bill is diverted to the reject pocket and the UF-1 machine continues transporting the subsequent bills. See Exhibit 1a at page 1 of Mouri declaration.

9. Users of the UF-1 currency counter and discriminator machine connected it to a desktop teller terminal which has a built-in printer in order to print information based on the results of the denominating. See Exhibit 2 at page 1 of Mouri declaration which shows a printer that is connected to the UF-1 machine.

10. The UF-1 currency counter and discriminator machine has a display which displays the total value of the bills contained in the output receptacle and the number of bills of the different denominations contained in the output receptacle. See Exhibit 1a at page 4-5 and Exhibit 2 of Mouri declaration.

11. The UF-1 currency counter and discriminator machine processes Japanese currency bills at a speed of at least 480 bills per minute (bpm). The overall speed of the UF-1 machine was primarily limited by the speed of the microprocessor that controlled the automatic discriminating function and other operations of the machine. If a more advanced and faster microprocessor were used, the denominating speed and the overall speed of the machine could be easily increased to above 1000 bpm.

12. The UF-1 machine is controlled by a LH-0080A-D (known as the "Z80") model microprocessor made by Sharp. The Z80 is an 8-bit processor operated with a 4MHz clock and performs 1 instruction execution per microsecond. Many faster processors were available around 1985 to 1989. For example, the NEC PD70216 is a 16-bit processor that can execute instructions at a rate of 4 per microsecond. This processor was available in 1987 and would

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execute instructions that ran on the Z80. Because of its faster speed and wider bus, it could run up to 8 times faster than the Z80 processor used in the UF-1 machine. Even wider and faster processors existed, such as the Motorola 68000 (32-bit, 4 instructions per microsecond) which is 16 times faster than the Z80 model processor used in the UF-1 machine.

13. In 1985-1989, the UF-1 currency counter and discriminator machine could also be used to denominate U.S. currencies by simply replacing the magnetic sensor with a reflective spot sensor that was available in 1987-1989 and by easily modifying the algorithm used in the machine.

14. In 1990, Glory Ltd. began developing the GFB-30 which is a desktop currency counter and discriminator machine.

15. From January 29, 1991 - 1998, Glory Ltd. sold hundreds of the GFB-30 currency counter and discriminator machines in Japan.

16. The GFB-30 currency counter and discriminator machine contains a single input receptacle and a single output receptacle. The currency bills to be processed are transported one by one from the input receptacle to the output receptacle in a direction parallel to the narrow dimension of the bills.

17. The GFB-30 currency counter and discriminator machine uses an optical imaging technique and a side detection technique to automatically determine the denominations of the bills. An optical spot sensor is positioned along the transport path to detect transparent light from a bill passing by the sensor.

18. The GFB-30 currency counter and discriminator machine has several modes of operation. In one mode, the GFB-30 processes a stack of currency bills having mixed denominations, determines the denomination of the first bill and counts the number of bills of the first denomination. When the machine encounters a bill that is not the first denomination (a "reject"), the

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transport operation stops and an alarm sounds to alert the operator. See Exhibit 6 at page 5 of the Mouri declaration.

19. In January, 1991, GFB-30 currency counter and discriminator machine could also be used to denominate U.S. currencies by simply replacing the side detector sensor with a reflective spot sensor that was available in 1987-1989 and by easily modifying the algorithm used in the machine. The speed of 1000 bpm could be maintained by using a faster microprocessor which was available around 1987 - 1989.

20. I am also familiar with the design and operation of Billcon's D-202/204 currency counter and discriminator machine. I have operated the D-202/204 currency counter and discriminator machine and I have reviewed the owner's manual and service manual of the D-202/204 currency counter and discriminator machine.

21. The D-202/204 currency counter and discriminator machine contains a single input receptacle and a single output receptacle. The output receptacle is provided with a stacker wheel with flexible blades. The currency bills to be processed are transported one by one from the input receptacle to the output receptacle in a direction parallel to the narrow dimension of the bills.

22. The D-202/204 currency counter and discriminator machine uses an optical imaging technique to automatically determine the denominations of the bills. An optical sensor is positioned along the transport path to detect transparent light from a bill passing by the sensor. The machine determines the denomination of the bill by comparing the detected optical signal with characteristic patterns stored in the memory.

23. The D-202/204 currency counter and discriminator machine has several modes of operation. In a "mixed denominations" mode, the D-202/204 machine processes a stack of currency bills having mixed denominations,

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determines the denomination of each bill, counts the number of bills of each denomination, and totals the amount of the bills in the input stack. When the machine encounters a bill that it cannot discriminate (a "reject"), the transport operation stops and an alarm sounds to alert the operator. In this mode, after all of the bills in the input receptacle are processed, the output receptacle includes a set of bills, all of whose denominations are known including bills of a plurality of denominations.

24. In a "designated denomination" mode, the D-202/204 machine processes a stack of currency bills intended to have the same denomination. The machine verifies the denomination of each bill, counts the number of bills and totals the amount of the designated denomination in the input stack. When the machine encounters a bill that is other than the designated denomination, or a bill that cannot be discriminated, the transport operation stops and an alarm sounds to alert the operator.

25. The D-202/204 currency counter and discriminator machine processes Japanese currency bills at a speed of at least 600 bills per minute (bpm). The design of the transport mechanism including the input hopper and the output stacker is capable of operating at a higher speed of at least 1000 bpm. The overall speed of the D-202/204 machines was primarily limited by the speed of the microprocessor that controlled the automatic discriminating function and other operations of the machine. If a more advanced and faster microprocessor were used, the denominating speed and the overall speed of the machine could be increased to above 1000 bpm.

26. The D-202/204 machine is controlled by a μ PD780C-1 model microprocessor made by NEC. The μ PD780C-1 model microprocessor has the same functions and specification as the Z80 model microprocessor which was used in Glory's UF-1 currency counter and discriminator machine. The

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μ PD780C-1 is an 8-bit processor operated with a 4MHz clock and performs 1 instruction execution per microsecond. Many faster processors were available around 1987 to 1989. For example, the NEC PD70216 is a 16-bit processor that can execute instructions at a rate of 4 per microsecond. This processor was available in 1987 and would execute instructions that ran on the PD780C-1. Because of its faster speed and wider bus, it could run up to 8 times faster than the μ PD780C-1 processor used in the D-202/204 machines. Even wider and faster processors existed, such as the Motorola 68000 (32-bit, 4 instructions per microsecond) which is 16 times faster than the μ PD780C-1 model processor used in the D-202/204 machines.

27. In 1987-1989, the D-202/204 currency counter and discriminator machine could also be used to denominate U.S. currencies by simply replacing the transparency spot sensor with a reflective spot sensor that was available in 1987-1989 and by easily modifying the algorithm used in the machine.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Date: November 16, 2002

Toshio Numata

Toshio Numata

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